



Colorado Department  
of Public Health  
and Environment

## Completeness Checklist – Modeling Submittal

A complete modeling submittal for an air quality impact analysis of an application subject to Colorado Air Quality Control Commission Regulation 3<sup>1</sup> needs to represent the final design of the proposed project and addresses every element below:

### 1. Modeling Report

#### (a) General Input

- i. Description of the proposed project, description of the process including process flowchart, description of different operating scenarios if applicable, summary of emissions, and whether the facility is located in/nearby a nonattainment area
- ii. Pollutant(s) and averaging period(s) addressed and justification for pollutant(s) and averaging period(s) not modeled
- iii. Types of impact analysis submitted per pollutant/averaging period (i.e., significant impact analysis and/or cumulative/full/air quality impact analysis)
- iv. Horizontal datum and zone of the coordinate system used to setup the model
- v. Site/engineering plan drawn to scale and labeled with all of the following: north arrow, property lines and contours for site grading of the final facility design, fences, emission source points/areas (source IDs that match APEN/inventory IDs), buildings, structures (e.g., equipment housing), a geo-reference point (e.g., coordinate, datum) in both print and electronic formats
- vi. Figures - Overlay of modeled layout of the sources, buildings/structures, and receptor network onto USGS 1:24,000-scale topographic map at various scales (zoom to, at a minimum, the source under review, the full

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<sup>1</sup> Also refer to Colorado Air Quality Control Commission Regulation 3, Part D, Section II.A.11 if the permitting action is subject to this part.

modeling domain). This figure can be submitted in any of the following formats: \*.TIF, \*.JPG, \*.PDF, \*.SHP

- vii.** Figures - Overlay of modeled layout of the sources, buildings/structures, and receptor network onto recently-dated aerial imagery at various scales (zoom to, at a minimum, the source under review, the full modeling domain). This figure can be submitted in any of the following formats: \*.TIF, \*.JPG, \*.PDF, \*.SHP

#### **(b) Model Setup**

- i.** The version numbers of AERMAP, BPIPPRM, AERMOD, AERMET/AERMINUTE ( if applicable) and all other models relied upon to prepare the modeling submittal
- ii.** Description of the meteorological data and a copy of the meteorological determination email from MMEIU
- iii.** For Tier 3 NO<sub>2</sub> conversion, descriptions of the ozone data and in-stack NO<sub>2</sub>/NO<sub>x</sub> ratio(s) used and a copy of the ozone determination email from MMEIU and ratio approval from the Permitting Unit
- iv.** Description of the spacing of the receptor network<sup>2</sup>
- v.** Description of all areas where receptors have been omitted, if any, and if receptors have been excluded from within the property boundary, the basis for this approach
- vi.** The data type(s) that have been assigned terrain elevations using survey data/contours (e.g., receptors and type, emission releases at the source under review, emission releases at other sources, buildings/structures, etc).
- vii.** The data type(s) that have been assigned terrain elevations with AERMAP (e.g., receptors and type, emission releases at the source under review, emission releases at other sources, buildings/structures, etc).
- viii.** Description of the area coverage/boundary and resolution of the National Elevation Dataset file(s) used
- ix.** Structures/buildings that have been included and excluded in the downwash analysis

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<sup>2</sup> If a different receptor network was used for different pollutants and/or averaging periods, or for different types of impact analysis, then this item should be repeated for each receptor network.

- x.** Summary of the building/structure dimensions (height, width, length, and base elevation) and bases for the structure/building dimensions (e.g., actual, derived, etc)
- xi.** Structures/buildings that are beside each other with a distance in separation that is less than their smallest dimension (height or width)
- xii.** Adjacent structures/buildings that have been characterized to represent a single structure
- xiii.** The point sources for which downwash parameters have been specified
- xiv.** A copy of the nearby source inventory obtained from the Division, description of the nearby sources that have been explicitly modeled and, if applicable, the procedure for filling missing data
- xv.** Tables for each pollutant and averaging period (formats below) summarizing the emission rates and source characterization of each emission unit at the source under review and at nearby sources

Point Sources with a vertical release (not a flare)							
Pollutant:							
Averaging Period:							
Source ID	Description of source	Base elevation of the stack (m)	Emission rate (g/s)	Source release height above ground (m)	Stack gas exit temperature (K)	Stack gas exit velocity (m/s)	Stack inside diameter (m)

Point Sources (capped or horizontal release)												
Pollutant:												
Averaging Period:												
Source ID	Description of source	Capped or Horizontal	Base elevation of the stack (m)	Emission rate (g/s)	Stack Height		Stack gas exit temperature		Stack gas exit velocity		Stack inside Diameter	
					Value (m)	Basis/ derivation	Value (K)	Basis/ derivation	Value (m/s)	Basis/ derivation	Value (m)	Basis/ derivation

Flares											
Pollutant:											
Averaging Period:											
Source ID	Description of source	Base elevation of the stack (m)	Emission rate (g/s)	Stack Height		Stack gas exit temperature		Stack gas exit velocity		Stack inside Diameter	
				Value (m)	Basis/ derivation	Value (K)	Basis/ derivation	Value (m/s)	Basis/ derivation	Value (m)	Basis/ derivation

Volume Sources									
Pollutant:									
Averaging Period:									
Source ID	Description of source	Base elevation of source (m)	Emission rate (g/s)	Release height		Initial lateral dimension $\sigma_y$		Initial vertical dimension $\sigma_z$	
				Value (m)	Basis/ derivation	Value (m)	Basis/ derivation	Value (m)	Basis/ derivation

Area Sources									
Pollutant:									
Averaging Period:									
Source ID	Description of source	Base elevation of source (m)	Emission rate (g/(s-m <sup>2</sup> ))	Release height		Length of side X- and Y-dimension		Initial vertical dimension $\sigma_z$	
				Value (m)	Basis/ derivation	Values (m)	Basis/ derivation	Value (m)	Basis/ derivation

Areacircle Sources									
Pollutant:									
Averaging Period:									
Source ID	Description of source	Base elevation of source (m)	Emission rate (g/(s-m <sup>2</sup> ))	Release height		Radius		Initial vertical dimension $\sigma_z$	
				Value (m)	Basis/ derivation	Values (m)	Basis/ derivation	Value (m)	Basis/ derivation

Areapoly Sources									
Pollutant:									
Averaging Period:									
Source ID	Description of source	Base elevation of source (m)	Emission rate (g/(s-m <sup>2</sup> ))	Release height		Area		Initial vertical dimension $\sigma_z$	
				Value (m)	Basis/ derivation	Values (m <sup>2</sup> )	Basis/ derivation	Value (m)	Basis/ derivation

Openpit Sources									
Pollutant:									
Averaging Period:									
Source ID	Description of source	Base elevation of source (m)	Emission rate (g/(s-m <sup>2</sup> ))	Release height above base of pit		Length of side X- and Y-dimension		Pit Volume	
				Value (m)	Basis/ derivation	Values (m)	Basis/ derivation	Value (m <sup>3</sup> )	Basis/ derivation

- xvi.** Bases of inputs for the following AERMOD **S**ource pathway keywords provided in the applicant's permit application/report for each emission unit:

If included: LOCATION/FLAT, URBANSRC, EMISFACT, EMISUNIT, CONCUNIT, DEPUNIT, PARTDIAM, MASSFRAX, PARTDENS, METHOD\_2, GASDEPOS, NO2RATIO, HOUREMIS,

BACKGRND, BACKUNIT, OLMGROUP, PSDGROUP,  
SRCGROUP

- xvii.** If an emissions activity is represented by multiple sources (e.g., road), its characterization and basis/derivation
- xviii.** List the “SOURCE-RECEPTOR COMBINATIONS FOR WHICH CALCULATIONS MAY NOT BE PERFORMED” that have reported in the AERMOD output file(s) and describe each of the affected emission sources (e.g., haul road) and its characterization (e.g., volume)
- xix.** Bases of inputs for the following AERMOD **CO**ntrol pathway keywords:

MODELOPT, and if included, URBANOPT, HALFLIFE,  
DCAYCOEF, FLAGPOLE, GASDEPDF, GASDEPVD,  
GDLANUSE, GDSEASON, NO2EQUIL, NO2STACK, OZONEFIL,  
OZONEVAL, O3VALUES, OZONUNIT

**(c) General Output**

- i.** Background concentrations and a copy of the email from the Division that provides this information
- ii.** Model-estimated concentrations from the proposed project presented in isopleth map(s) and compared to the significant impact level(s) in tabular format
- iii.** Model-estimated concentrations (includes background and impacts from nearby sources) presented in isopleth map(s) and compared to the NAAQS in tabular format

**2. Modeling Files**

- (a)** All input and output files for the models AERMAP, BPIPPRM, AERMOD, AERMET/AERMINUTE ( if applicable) and all other models relied upon to prepare the modeling submittal